



UNITED STATES
COAST GUARD
ACADEMY

Science Lecture Series

Improving Ocean Computer Models for Rhode Island Coastal Waters

LT Ainsley Fruhwirth

Instructor, Department of Marine Science, USCGA

The Ocean State Ocean Model (OSOM), funded and developed through the National Science Foundation, was designed to simulate the physical dynamics of Rhode Island's estuaries and shelf waters. However, the model struggled to capture key features of summer circulation in Rhode Island Sound, most notably the westward flowing coastal current and vertical stratification profile found in May through September. Using historical datasets from the National Oceanic and Atmospheric Administration, as well as research cruises of Rhode Island Sound in 2010 and 2011, OSOM's input framework was completely overhauled to include relevant and accurate physical parameters. Input fields were replaced with higher resolution, spatially varying products and rebuilt to include realistic vertical structures to enhance stratification and correctly capture density gradients. An extensive suite of model simulations was conducted to test combinations of physical mixing parameters, which led to improvements in modeled temperature, salinity, and velocity fields. This OSOM code successfully reproduced the observed coastal current direction and magnitude within 20% error across the 2010 summer season.

Wednesday, November 4th, 2026

2000 - 2100

Dimick Auditorium, U.S. Coast Guard Academy

LT Ainsley Fruhwirth is from Exton, PA and is a 2018 graduate of the U.S. Coast Guard Academy. Upon graduation, she served as the Operations Officer and Boarding officer aboard the CGC Heriberto Hernandez (WPC 1114) homeported in San Juan, Puerto Rico. There she completed a variety of Coast Guard missions including Search and Rescue, Migrant Interdiction, and Counter-Drug. In 2020, she reported to CGC Healy (WAGB 20), homeported in Seattle, WA as the Assistant Operations Officer and Navigator. She was responsible for the planning and execution of the cutter's first NW Passage and Panama Canal transit since 2005. In 2022 she took command of the CGC Benjamin Dailey/Jacob Poroo ALT, homeported in Pascagoula, MS. She implemented and executed the Coast Guard's first dual-crew initiative aboard an FRC. LT Fruhwirth graduated from the University of Rhode Island in 2026 with her M.S. in Physical Oceanography.

**If you have any questions regarding the event, please contact Dr. Kanani K. M. Lee
(kanani.km.lee@uscga.edu) for more information.**